

CLAIMS

WHAT IS CLAIMED IS:

1. An electron source, comprising:
an electron emitter for generating an electron beam;
a first deflection stage for radiating the electron beam onto a sample; and
a second deflection stage being arranged between the first deflection stage and the sample and being adapted for a beam orientation correction.
2. The electron source according to claim 1, wherein the second deflection stage is arranged near the sample.
3. The electron source according to claim 1 or 2, further comprising a casing extending from the first deflection stage to the second deflection stage.
4. The electron source according to claim 3, wherein the casing is made of or covered with a magnetic field shielding material.
5. The electron source according to claim 3, wherein an inner space of the casing is connected with a pumping device being adapted for evacuating the inner space of the casing.
6. The electron source according to claim 3, wherein an aperture is provided at or near the second deflection stage.
7. The electron source according to claim 6, wherein the aperture has a point shape or a slit shape.
8. The electron source according to claim 1 or 2, wherein a third deflection stage is provided between the second deflection stage and the sample.
9. The electron source according to claim 8, wherein the aperture is provided between the second and third deflection stages.
10. The electron source according to claim 6, wherein the aperture is covered with a foil capable of transmitting the electron beam.
11. A Reflection High Energy Electron Diffraction (RHEED) measurement system, comprising an electron source according to claim 1, a sample holder for supporting said sample to be investigated and a detector device for detecting diffracted electrons.
12. The RHEED measurement system according to claim 11, wherein the sample holder is positioned in a vacuum chamber.
13. The RHEED measurement system according to claim 11, wherein an aperture is provided at or near the second deflection stage, the aperture is covered with a foil capable of transmitting the electron beam, and the sample holder is positioned under atmospheric pressure.

14. A method of radiating an electron beam with an electron source onto a sample, comprising the steps of:

generating the electron beam with an electron emitter;
directing the electron beam with a first deflection stage towards the sample; and
correcting the beam orientation of the electron beam with a second deflection stage being arranged between the first deflection stage and the sample.

15. The method according to claim 14, wherein the electron beam is deflected from an optical axis with the first deflection stage, wherein the beam travelling between the two deflection stages becomes elongated from the axis and the second deflection stage is bending the beam back towards the axis of the electron source.

16. The method according to claim 14 or 15, wherein a radiation path of the electron beam between the first and second deflection stages is shielded with a casing.

17. The method according to claim 16, wherein the path of the electron beam within the casing is shielded against magnetic fields.

18. The method according to claim 17, wherein an inner space of the casing is evacuated with a pumping device.

19. The method according to claim 18, wherein the irradiated sample is located under atmospheric pressure.